한국동물분류학회지 제12권 제3호
The Korean Journal of Systematic Zoology
Vol. 12, No. 3: 265-280 (September 1996)

Syllid Polychaetes of the Genera *Langerhansia* and *typosyllis* (Annelida) from South Sea and East Sea, Korea

Jong Wui Lee and Boon Jo Rho
(Department of Biological Science, College of natural Sciences, Ewha Womans University, Seoul 120-750, Korea)

ABSTRACT

Two species of the genus *Langerhansia* and nine species of the genus *Typosyllis* are identified from the South Sea and East Sea in Korea. Of these eleven species, four species are newly recorded from Korean waters. They are *Langerhansia cornuta, L. rosea, Typosyllis okadai*, and *T. hyalina*. Genus Langerhansia is reported in Korea for the first time.

Key words: Systematics, syllid polychaetes, Annelida, Korea

INTRODUCTION

The present study was carried out to clarify the systematic status of the species belonging to two genera (*Langerhansia* Czerniavsky, 1881; *Typosyllis* Langerhans, 1879) of family Syllidae from South Sea and East Sea in Korea. In the present study, 11 species in 2 genera are recognized. Of them, four species are known to be new korean fauna: *Langerhansia cornuta, L. rosea, Typosillis okadai*, and *T. hyalina*. The syllids belonging to the genus *Langerhansia* includes only six species up to date all over the world. Among them, one species has been reported from China and four species from Japan. But there has been no report on this genus from Korea until now. In this paper, the genus *Langerhansia* is newly recorded from Korea. Records on genus *Typosyllis* from Korea are comparatively scarce despite that over 20 species belonging to this genus have been known all over the world. Only seven species are known from Korean coasts (Paik, 1976, 1979, 1982; Rho and Lee, 1982, 1987, 1988). Summing up the results of the foregoing papers including the present one, the total of 9 species of *Typosyllis* have been known from Korea.

All specimens examined are deposited in the Department of Biological Science, Ewha Womans University.

We adopted the classification schemes established by Imajima (1966).

SYSTEMATIC ACCOUNT

Order Errantia Audouin & Milne-Edwards, 1832 유영목
Family Syllidae Grube, 1850 염주발갯지렁이과
Subfamily Syllinae Rioja, 1925 참염주발갯지렁이아과
Genus *Langerhansia* Czerniavsky, 1881 참염주발갯지렁이속

Key to species of *Langerhansia* from Korea

1. Folcigerous compound seta accurring first parapodia; superior simple seta without second tooth in posterior parapodia ..... *Langerhansia cornuta*
   Folcigerous compound seta occurring from more posterior parapodium; superior simple seta with second tooth ..... *Langerhansia rosea*

1. *Langerhansia cornuta* (Rathke, 1843) 뿔염주발갯지렁이(신칭) **(Fig. 1)**

Syllis cornuta: McIntosh, 1904, p. 37; 1908, p. 200, pl. 79, fig. 16.

Syllis (Ehlershia) cornuta: Fauvel, 1923, p. 267, fig. 100 g-i; Monro, 1937, p. 273; Uschacov and Wu, 1962, p. 59; Day, 1967, p. 244, fig. 12.2 s-u.

Ehlersia cornuta: Hartman, 1945, p. 15; Amourex et al., 1978, p. 107.

Langerhansia cornuta: Hartman, 196, p. 83; 1966, p. 194; Imajima, 1966, p. 256, text-fig. 51; 1983, p. 298, fig. 36 i-s.

Syllis (Langerhansia) cornuta: Day, 1967, p. 244, fig. 12.2 s-u.

Typosyllis (Langerhansia) cornuta; Hartman-Schröder, 1971, p. 147.

Material examined. 1 specimen, Samch'ŏnp'o, 21 July 1984 (B.J. Rho); 1 specimen, P'ohang (10 m depth), 27 Oct. 1985 (S.J. Yoon); 13 specimens, Sŏngsanp'o, 8 Oct. 1987 (B.J. Rho & J.W. Lee); 5 specimens, Sŏgwip'o, 8 Jan. 1990 (B.J. Rho & J.W. Lee); 3 specimens, Hup'o, Sangch'ujado, 24 July 1990 (J.W. Lee); 1 specimen, Pŏmsŏm, Chejudo, 22 Oct. 1991 (scuba).

Description. Body color preserved in formalin whitish yellow and without color marking. Largest specimen with 86 segments, 10.77 mm long and 0.31 mm wide excluding parapodia. Prostomium pentagonal, approximately 1.3 times wider than long. Three pairs of reddish eyes; anterior pair very small and located near to anterolateral margin of prostomium, remaining two pairs larger and located posterior half of prostomium, in trapezoidal arrangement with anterior larger pair (Fig. 1a). Median antenna with 17-23 annulations, originating between posterior eyes. Paired lateral antennae with 9-13 annulations, approximately half length of median antenna, originating from anterolateral prostomial lobe. Posterior one half of palps fused, each approximately 1.5 times as long as median prostomial length. Pharynx red, with subdistal middorsal tooth, located from 1st to 9th or from 2nd to 11th setigerous segment in relaxed specimen. Proventriculus extending from 9th to 15th or from 12th to 16th setigerous segment. Tentacular segment shorter than following segment, with two pairs of tentacular cirri; dorsal pair with 12 to 14 annulations, ventral pair with 8 to 11 annulations. First dorsal cirri with 17 to 20 annulations, second with 8 to 9, third with 9 to 11, fourth with 14 to 15,

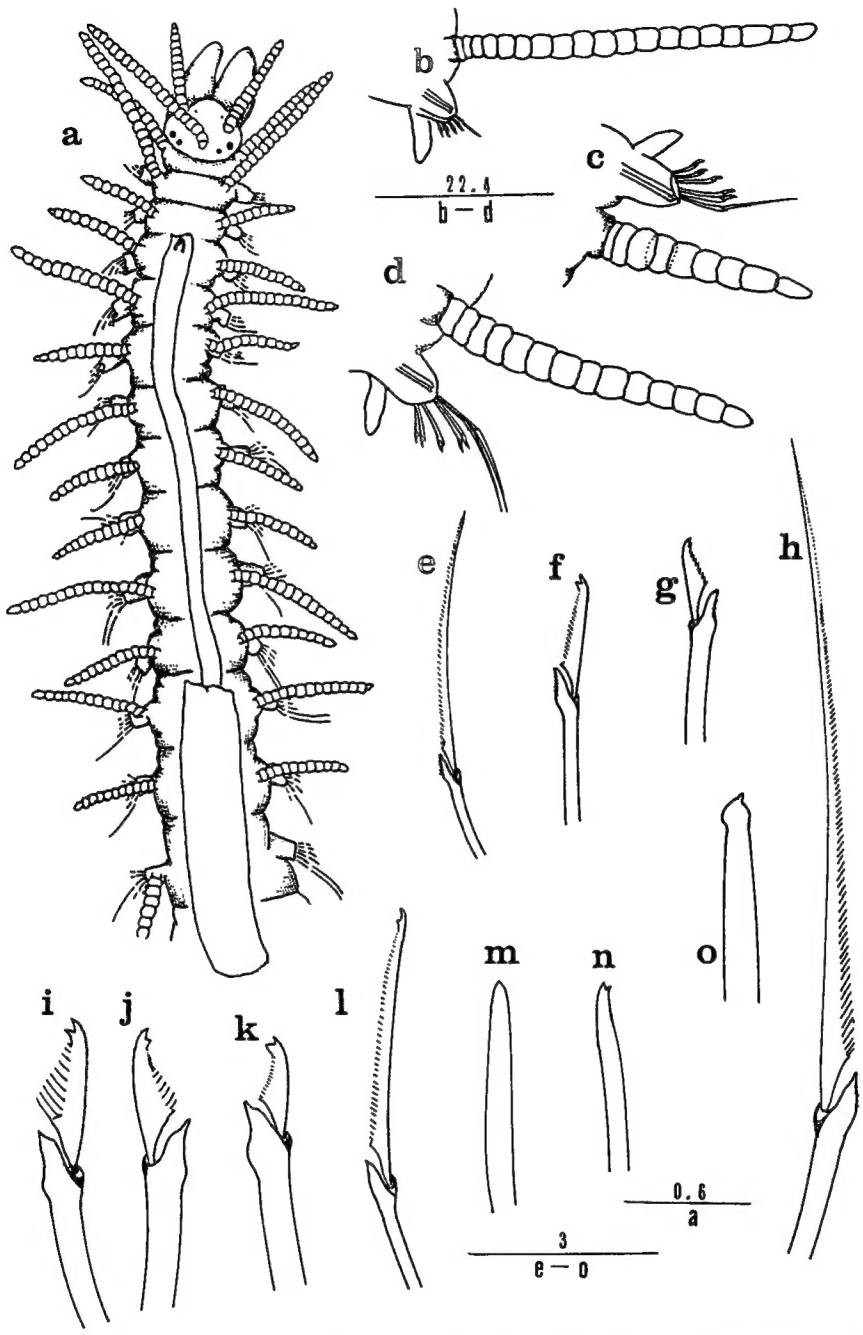

Fig. 1. *Langerhansia cornuta* (Rathke, 1843): a, anterior end, in dorsal view; b, first parapodium; c, median parapodium; d, median parapodium with short cirrus; e, superior spingerous seta from first parapodium; f, superior bidentate compound seta from the same, g, inferior bidentate compound seta from the same; h, superior spingerous seta from median parapodium; i, superior bidentate compound seta from the same; j, median bidentate compound seta from posterior parapodium; k, inferior bidentate compound seta from the same; l. superior bidentate compound seta from the same; m, superior simple seta from the same; n, inferiormost simple seta from the same; o, acicula from median parapodium. (unit of each scale: a = mm, b~n = μm)

fifth with 9 to 12. In median region, long dorsal cirri (Fig. 1d) with 11 to 16 annulations alternating to short ones (Fig. 1e) with 7 to 13 annulations. Ventral cirri originating from base of parapodial lobe, extending above tip of parapodial lobe in first setiger and to tip in median setiger. Compound seta numbering 10 to 11 in each parapodium of anterior segments, and 5 to 6 in median parapodium. Parapodium with two kinds of compound seta; one with long, unidentate spingerous blade, the other with short, bidentate falcigerous blade. Superior spingerous compound seta appearing from first parapodia (Fig. 1e); its blade with thin spingerous serrations from base to near tip; 3.59-4.83 um long on first parapodia, 4.95-5.94 um long on second and third parapodia, 7.67-9.53 um long on median parapodia (Fig. 1h). Compound falcigerous seta with thin serrations below secondary tooth; inferior falcigerous blades in anterior parapodia 0.74-1.24 um long (Fig. 1f, g), those in median parapodia 0.99-1.34 um long (Fig. 1i). Posterior parapodia with additional superior and inferior simple seta; former with blunt tip (Fig. 1m) and latter (Fig. 1n) with weak secondary tooth. Acicula (Fig. 1o) numbering two in each parapodium of anterior segment (one stright, another slightly bent near tips); one in median and posterior parapodia, with tip slightly bent.

Habitat. Among seaweed, crevice in rock, surface of ascidian.

Distribution. Norway, Mediterranean Sea, Persian Gulf, Arabian coast, Zanzibar, South Africa, North Carolina, Hawaii, Indian Ocean, Indo-China, Yellow Sea, Japan, Korea.

Remarks. The present materials are in agreement with the description by Imajima (1966, 1983) in the following main key characters: the shape of prostomium, the ratio of prostomium to palp, shape and length of cirri, pharynx and proventriculus, shape of seta, except the length of median dorsal cirri on the specimens collected from Pŏmsŏm in Korea: In specimen from Pŏmsŏm, median dorsal cirri alternate long with 12-13, and short with 8-9annulations. While, in the description by Imajima, they have 20 and 13 rings, respectively. Day (1967) did not record that long dorsal cirri is alternately with short one in median part of the body. But, in his description, annulation of dorsal cirri ranges 10-18 joints (our specimens 8-20). In description by Hartman (1945, 1966), short composite seta number 6-8 in a parapodium. But, in our specimens, short composite seta 10-11 in anterior parapodium and 5 in median and posterior parapodium. Specimens collected from Pŏmsŏm have thinner cirri than ones collected from other sites in Korea. Swimming seta is present from 64th to 71th of 73 setigerous segments. This genus and species is recorded for the first time from Korea.

2. *Langerhansia rosea* (Langerhans, 1879) 장미염주발갯지렁이(신칭) **(Fig.2)**

Langerhansia rosea: Imajima, 1966, p. 259, text-fig. 52; 1983, p. 298, fig. 37 a-i.

Material examined. 1 specimen, Sŏngsanp'o, 16 July 1987 (J.W. Lee), 13 specimens, Sŏngsanp'o, 8 Oct. 1987 (B.J. Rho & J.W. Lee); 19 specimens, Naejangdo, Kŏmundo, 24 July 1988 (B.J. Rho & J.W. Lee); 14 specimens, Sŏdo, Kŏmundo, 29 July 1988 (B.J. Rho & J.W. Lee); 1 specimen, Wimiri, Chejudo, 9 Dec. 1988 (J.W. Lee); 1 specimen, Taep'o, Chejudo, 10 Dec. 1988 (J.W. Lee); 1 specimen, Piyangdo, 11 Dec. 1988 (J.W. Lee); 1 specimen, Yundolsŏm, 19 July 1989 (J.I. Song); 1 specimen, Chikgudo, 22 July 1990 (J.W. Lee); 20 specimens, Hup'o, Sangch'ujado, 24 July 1990 (J.W. Lee).

Description. Body preserved in formalin twinted with white. Largest specimen with 124 segments, 20mm long and 0.5 mm wide excluding parapodia. Prostomium elliptic (Fig. 2a); wider than long (ratio of median length to width 1:1.4); anteromedian part and lateral margins roundish. Two pairs of

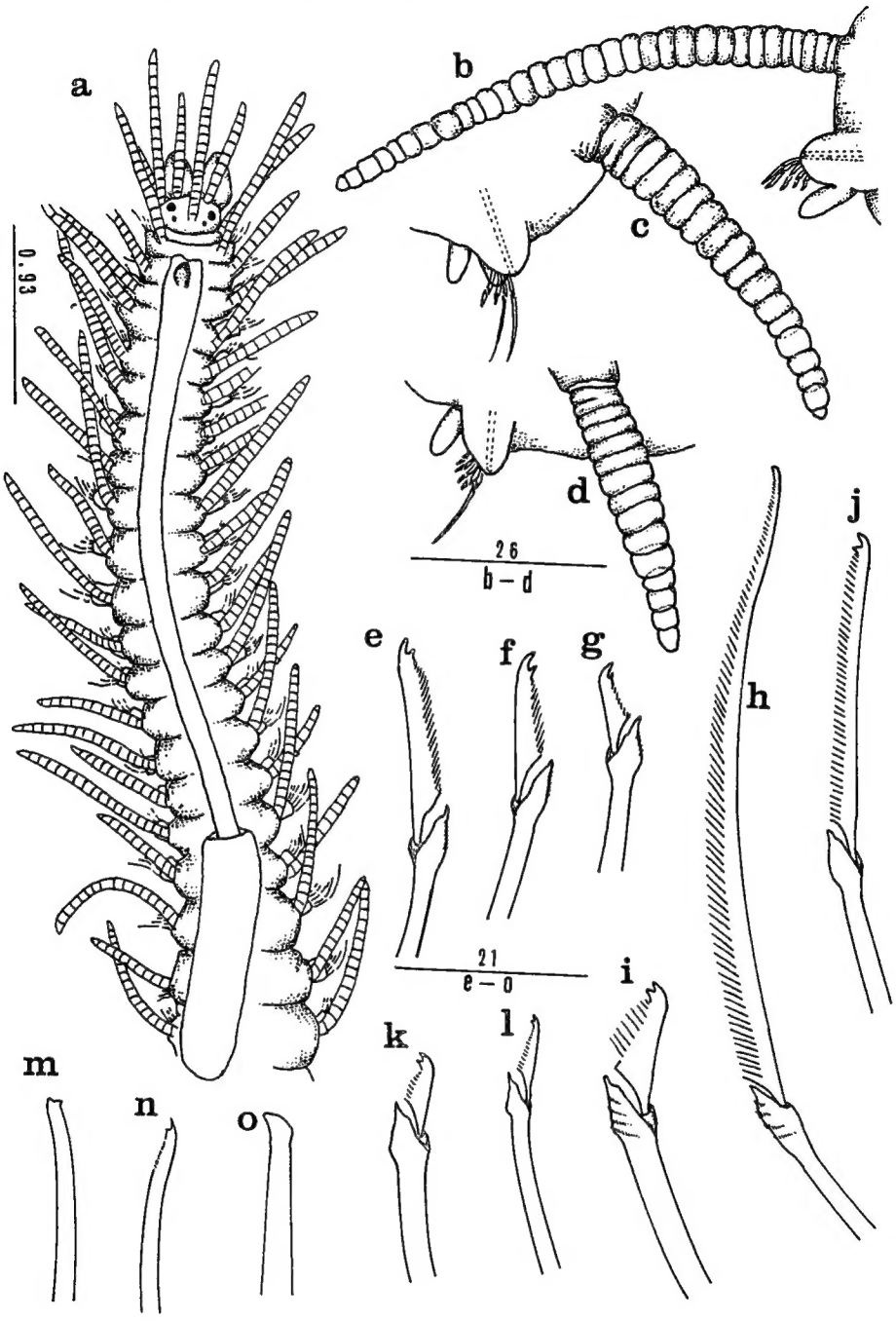

Fig. 2. *Langerhansia rosea* (Langerhans, 1879): a, anterior end, in dorsal view; b, first parapodium; c, median parapodium with long dorsal cirrus; d, median parapodium with first short dorsal cirrus; e, superior bidentate compound seta from first parapodium; f, median bidentate compound seta from the same; g, inferior bidentate compound seta from the same; h, superior compound seta from posterior parapodium; k~l, inferior compound seta from the same; m, superior simple seta from the same; n, inferiormost simple seta from the same; o, acicula from the same. (unit of each scale: a = mm, b~o = μm)

red eyes in trapezoidal arrangement open to front; anterior pair larger than posterior pair. Median antenna with 22-28 annulations, originating between posterior eyes. Lateral antennae with 14-19 annulations, originating on anterolateral margin of prostomial lobe. Palps fused at base. Length of palps and prostomium in ratio of 1.3 : 1. Pharynx red, long, occupying 10-11 segments; chitinous wall relatively thin; with subdistal middorsal tooth of average size. Proventriculus white, thick, in setigerous segment 11-14 or 13-16. Tentacular segment two thirds length of following segment. Dorsal tentacular cirri with 20-25 annulations, similar in length to median antenna. Ventral tentacular cirri with 11-14 annulations, slightly more than half length of dorsal tentacular cirri. Dorsal cirri with 27-34 annulations on setigerous segment 1, 16-22 annulations on setigerous segment 2, 15-24 annulations on setigerous segment 3, 25-28 annulations on setigerous segment 4; in median region, long dorsal cirri (Fig. 2c) with 21-26 annulations alternating to short ones (Fig. 2d) with 13-18 annulations. Compound falcigerous seta in shape with bidentate; blade of superior seta 2.22-2.28 um long (Fig. 2e), that of inferior seta (Fig. 2g) 0.50- 0.99 μm long on first parapodia. Blade of superior seta growing longer, approximately 3.2 um long on forth parapodia. Superior blade suddenly lengthened on eight to tenth parapodia, 5.20-6.68 um long; its length five times as long as length of inferior blade. In median region, superior spingerous blade (6.68 μm) (Fig. 2h) approximately 7.7 times as long as inferior folcigerous blade (0.87 μm) (Fig. 2i). Posterior parapodia with additional superior and inferior simple seta; former (Fig. 2m) not acute, finely serrated below indistinctive secondary tooth; latter (Fig. 2n) with acute tips, with one secondary tooth on concave side near tips. Acicula (Fig. 2o) one or two; tips slightly bent.

Habitat. In seaweeds and Porifera, crevice of rock, in intertidal zone.

Distribution. Madeira, southern Japan, Korea

Remarks. This species has been recorded only from Japan (Imajima 1966,1983) since that Langerhans (1879) recorded from Madeira for the first time. I can't see original description of Langerhans. The characters of the present materials are in well agreement with description by Imajima (1966, 1983) from Japan following the main key characters of *L. rosea:* shape and number of seta, shape of prostomium, arrangement of eyes, location of middorsal tooth on pharynx, length of antennae and cirri. This species is tropical water form and was only collected from the south of the 35°N in Korea. It is new to Korea

Genus Typosyllis Langerhans, 1879 참염주발갯지렁이

Key to the species of *Typosyllis* from Korea

1. Each segment triannulate ····· *Typosyllis nipponica*
   Each segment uniannulate ····· 2
2. Dorsal cirri in median region with fewer than 20 annulations ····· 3
   Dorsal cirri in median region with more than 20 annulations ····· 5
3. Shaft of median seta different from that of anterior seta in shape ····· *Typosyllis okadai*
   Shaft of median seta similar to that of anterior seta in shape ····· 4
4. Blades of all parapodia similar in shape and size ····· *Typosyllis hyalina*
   Blades of median parapodia thicker than those of anterior and posterior parapodia
   ····· *Typosyllis aciculata orientalis*

5. Dorsum with color pattern 6
Dorsum without color pattern 7
6. Dorsum of each segment brown with middorsal, transversally oval white color ..... *Typosyllis adamanteus kurilensis*
Dorsum of each segment with transverse chocolate colored band, compound seta with weak secondary toot ..... *Typosyllis ehlersioides*
Dorsum with hexagonal color pattern, compound seta with distinctive secondary tooth ..... *Typosyllis variegata*
7. Compound seta unidentate ..... *Typosyllis fasciata*
Compound seta distinctive bidentate ..... *Typosyllis prolifera*

3. *Typosyllis nipponica* Imajima, 1966 녹색염주발갯지렁이

Typosyllis nipponica Imajima, 1966, p. 266, text-fig. 55 a-o; 1983, p. 377, fig. 38 a-o; Paik, 1982, p. 777, pl. 9 i-j; Rho and Lee, 1987, p. 77; 1988, p. 129.

Material examined. 1 specimen, Kuryongp'o, 25 Dec. 1974 (Rho), 1 specimen, Pijindo, 18 Sep. 1983; 1 specimen, Kuryongp'o, 22 July 1986 (J.W. Lee); 1 specimen, Supsŏm, 10 m depth, 14 July 1987 (J.W. Lee); 1 specimen, Tŏksan, 12 Aug. 1987 (B.J. Rho); 4 specimens, Todong, 19 June, 1988 (B.J. Rho & J.I. Song); 1 specimen, T'aeha, 20 June, 1988 (B.J. Rho); 2 specimens, Sŏdo, 29 July 1988 (B.J. Rho); 12 specimens, Kŭmhodo, 31 July 1988 (J.W. Lee); 10 specimens, Wimiri, 9 Dec. 1988 (J.W. Lee); 3 specimens, Nodo, 27 Apr. 1990 (J.W. Lee); 32 specimens, Jukjong, 1 July 1991 (J.W. Lee); 1 specimen, Pŏmsŏm, 22 Oct. 1991 (scuba); 6 specimens, Ch'agwido, 23 Oct. 1991 (scuba); 1 specimen, Kŭmnyong, 24 Oct. 1991 (J.I. Song); 1 specimen, Yoch'on, 4 Nov. 1991 (E.K. Kim); 2 specimens, Tadaep'o, 25 Nov. 1991 (J.H. Won).

Habitat. Surface of ascidian, Bryozoa and coral, from seaweed, in Porifera, crevice of rock, among tubes of polychaete, in silt.

Distribution. Southern to nothern Japan, Korea.

4. *Typosyllis okadai* (Fauvel, 1934) 오까다염주발갯지렁이(신칭) (Fig.3)

Syllis okadai Fauvel, 1934, p.307, text-fig.1,2

Typosyllis okadai: Imajima and Hartman, 1964, p. 137; Imajima, 1966, p. 268, text-fig. 56; 1983, p. 377, Fig. 39 a-k.

Material examined: 3 specimens, Wimiri, Chejudo, 9 Dec. 1988 (J.W. Lee).

Description: Largest specimen with 108 segments, 11.58 mm long and 0.38 mm wide excluding parapodia. Dorsum of setigerous segment 1st, 2nd, 7th, 8th dark brown and 9th slightly brown in color, especially setigerous segment 2nd and 7th darker (Fig. 3a). Prostomium wider than long; anterior margin nearly straight, with rounded corners; posterior with median concavity. Two pairs of reddish eyes trapezoidal arrangement; anterior pair larger than posterior pair. Median antenna with 17 annulations, originating from about middle of prostomial lobe. Lateral antennae with 15 annulations, originating on anterolateral margin of prostomial lobe. Palps fused at base. Retracted pharynx red (Fig. 3b), extends from 1st to 6th ($5\frac{1}{2}$ segments) setigerous segment; chitinous tooth small, situated at the part of one third of the pharynx. Proventriculus located in setigerous segments 7-17. Dorsal tentacular cirri with 17 annulations. Ventral tentacular cirri with 13 annulations, three

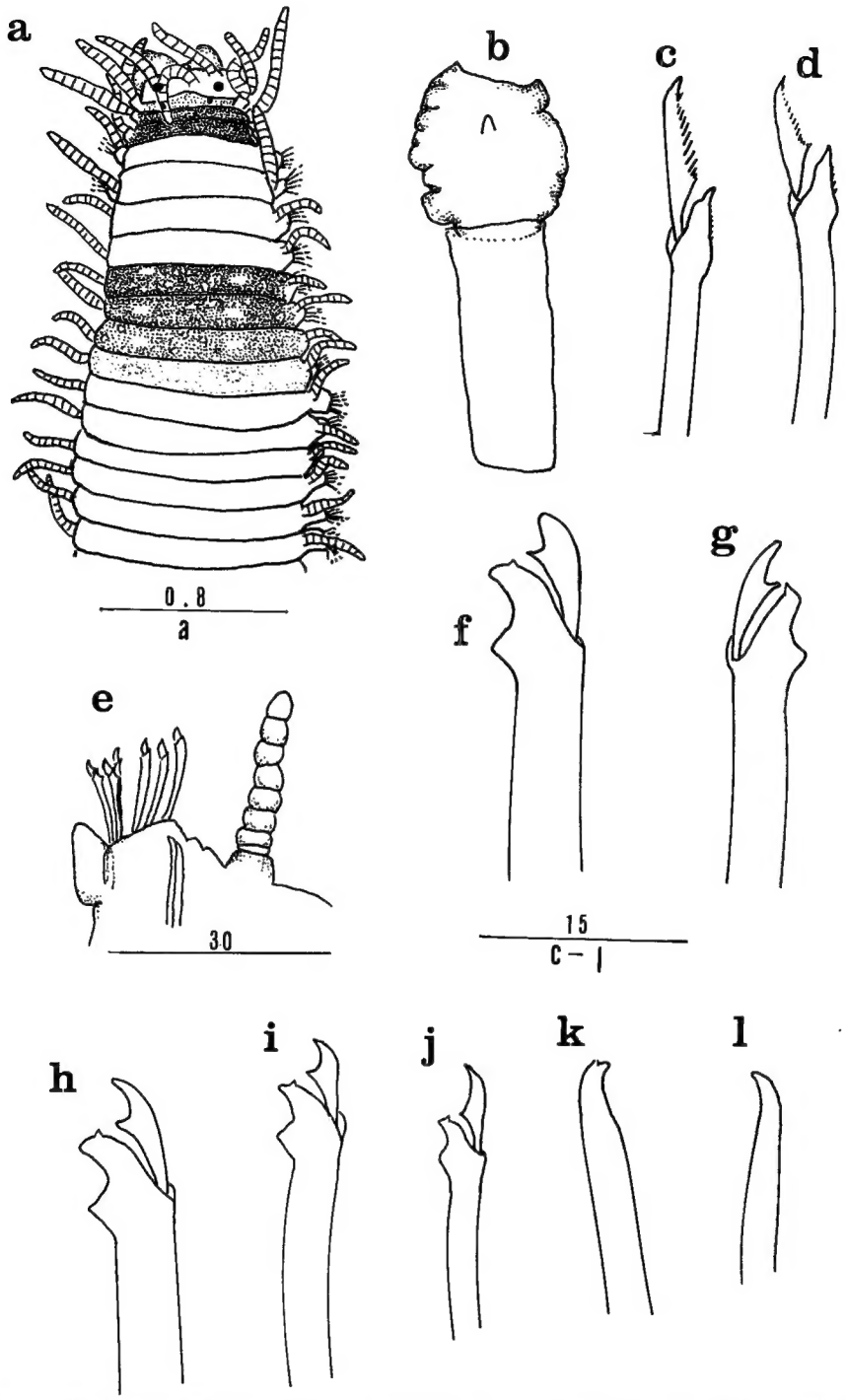

Fig. 3. *Typosyllis okadai* (Fauvel, 1934): a, anterior end, in dorsal view; b, pharynx with tooth and proventriculus; c, superior compound seta from first parapodium; d, inferior compound seta from the same; e, median parapodium; f, superior compound seta from median parapodium; g, inferior compound seta from the same; h~j, compound seta from posterior parapodium; k, superior simple seta from the same; l, inferiormost simple seta from the same. (unit of each scale: a = mm, b~l = μm)

fourth length of dorsal tentacular cirri. Dorsal cirri with 27 annulations on setigerous segment 1. In median region, long dorsal cirri with 10 to 11 annulations alternate to short ones with 7-8 annulations. In anterior part of the body, one parapodium with twelve to fourteen compound seta, all blades with fine serrations (Fig. 3c, d) on convex edge; blades of superior seta(2-2.13 um) (Fig. 3c) longer than inferior one (1.63-1.75 um) (Fig. 3d); superior and middle blades bidentate; inferior blade unidentate. Six compound seta in median parapodium; blades unidentate, without serration (Fig. 3f, g), 1.88-2 um long, three fourths to twice thicker than those of anterior; shafts of seta in shape different from those of anterior, 2.67-1.67 times thicker those of anterior. Posterior parapodia provided with compound seta (Fig. 3h-j) similar to those in median, with additional superior (Fig. 3k) and inferior (Fig. 3l) simple seta; former with large subdistal secondary tooth and latter with hooked unidentate tip. Acicula five in each parapodium of anterior segment and decreasing gradually to one in posterior parapodium.

Habitat. From seaweed.

Distribution. Japan, Gulf of Thailand, Andaman Islands, Korea.

Remarks. This species is new to Korea. For the identification of this species, the authors referred to the original paper of Fauvel (1934), to the description of Imajima and Hartman (1964) and Imajima (1966, 1983). The morphological characters of our specimens similar to description of Fauvel (1934) except for the length of median short dorsal cirri. In our present specimen, median short dorsal cirri have 7-8 articles in number instead of 10-12 showing in description of Fauvel. The morphological characters of our present specimens similar to description of Imajima and Hartman (1964), and Imajima (1966, 1983). But there are some differences in the following aspects. Our specimen is shorter than specimen showing in the description of Imajima from Japan in body length. And in annulations composing of median antenna, our specimen outnumber specimen of Japan. In our specimen, body length is 11.58 mm, median antenna has 17 annulations instead of 24 mm, 20 annulations. But our specimens has more annulations than the specimens of Japan in the first dorsal cirri. In our specimen first dorsal cirri has 27 annulations instead of 21-23 annulations. In our specimen, unidentate compound seta from median parapodium has no minute serrations while in the specimens of Japan they have minute serrations along the cutting margin. In our specimens, proventriculus extends over 8 segments instead of 6.

5. *Typosyllis hyalina* (Grube, 1863) 빛염주발갯지렁이(신칭) (Fig. 4)

Syllis (Typosyllis) hyalina: Fauvel, 1923, p. 262, fig. 98 a-c.

Syllis hyalina: Berkly and Berkly, 1948, p. 74, figs. 107-108; Barnes and Hodson, 1968 p. 62; Kudenov, 1980, p. 98; Imajima, 1983, p. 378, fig. 239 l-t.

Typosyllis hyalina: Hartman, 1964, p. 95, pl. 29, fig. 5; 1966, p. 199; 1968, p. 487; Imajima, 1966, p. 271, text-fig. 57.

Material examined. 4 specimens, Changho, 7 Aug. 1983 (J.H. Park); 2 specimens, Todong, Ulŭngdo, 16 Sep. 1988 (B.J. Rho); 1 specimen, Ch'agwido, 23 Oct. 1991 (J.I. Song); 8 specimens, Chŏdong, Ulŭngdo, 29 Nov. 1991 (scuba).

Description: Largest specimen 22.8 mm long for 81 segments, and 1.24 mm wide excluding parapodia. Entire dorsum with broad, transverse bands of brown color on every one to three segments (Fig. 4a). Prostomium approximately 1.5 times as wide as median length; posterior part of

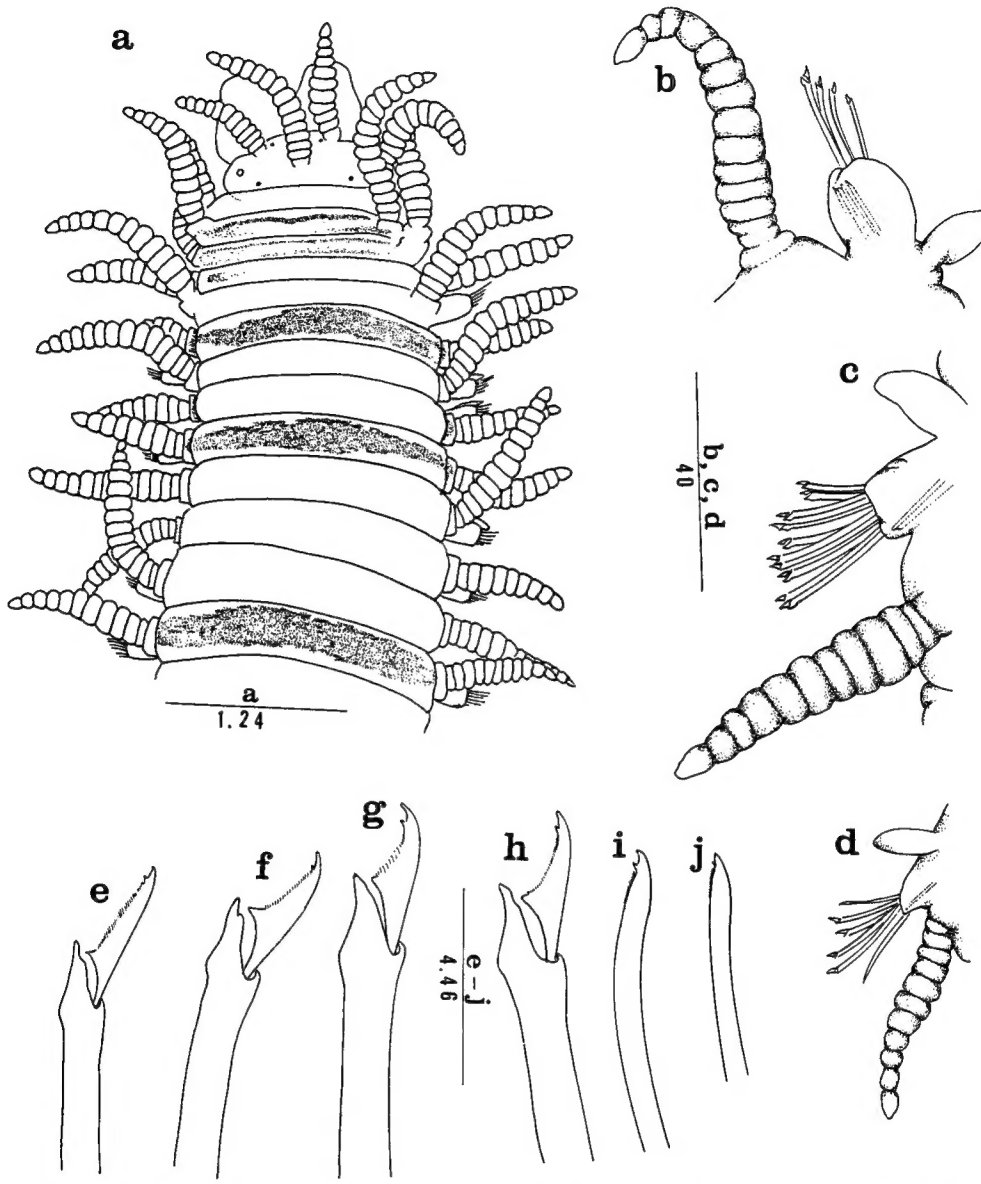

Fig. 4. *Typosyllis hyalina* (Grube, 1863): a, anterior end, in dorsal view; b, anterior parapodium; c, median parapodium with short dorsal cirrus; d, posterior parapodium; e, superior compound seta from first parapodium; f, inferior compound seta from same parapodium; g, compound seta from median parapodium; h, compound seta from posterior parapodium; i, inferiormost simple seta from the same; j, superior simple seta from the same. (unit of each scale: a = mm, b~j = μm)

prostomium covered with tentacular segment. Three pairs of eyes; one pair of eyesports adjacent to origins of lateral antennae; two pairs of eyes located on posterior half in trapezoidal arrangement opening to front, anterolateral pair larger than posterior pair. Median antenna with 16 annulations, originating between anterior pair of eyes. Lateral antennae with 15 annulations, originating on anterolateral borders of prostomium lateral to anterior eyespots. Posterior half of palps fused, each subtriangular and about as long as prostomial width. Pharynx red slightly shorter than proventriculus,

with small subdistal middorsal tooth. Proventriculus located in setigerous segments 14-24, approximately 1.20 mm long, 0.60 mm wide. Dorsal tentacular cirri with 16 annulations; ventral tentacular cirri with 12 annulations. First dorsal cirri longer than follow ones, with 18 annulations. Dorsal cirri beginning at about setigerous segment 8, alternating long and short; with 15-16 annulations on long cirri and 11-13 annulations on short cirri of median segments. Seta compound falcigers; blades bidentate with weak secondary tooth and its edge serrated to near secondary tooth. In first parapodia, superior blade (Fig. 4e) 2.23 um long; it approximately 1.4 times as long as inferior blade (Fig. 4f). Blades of compound seta on median and posterior parapodia wider than ones on anterior parapodia. On median parapodia, superior blade (Fig. 4g) 2.475 um, inferior one 2.10 um. Posterior parapodium with superior and inferior simple seta; former (Fig. 4j) with weak subdistal accessary tooth; inferior (Fig. 4i) with small, distinctive subdistal secondary tooth. Acicula four in each parapodium of anterior segments and decreasing gradually to one in posterior parapodium.

Habitat. Among seaweeds, surface of ascidian.

Distribution. Mediterranean Sea, Vancouver Island, Canada, California, North Atlantic Ocean, Magellan Strait, Adare cape, tropical region of South Africa, Moroco, Madagascar, Japan, Korea.

Remarks. This species is new to Korea. The morphological characteristics of our present specimens are similar to the descriptopn of Bans and Hodson (1968). He didn't explain in detaile. In our specimens, dorsal cirri of median segments are alternated the long and the short. they are 15-16 and 11-13 annulations respectively. But in the description of Banse and Hodson, they are 8-12 or 14 and 6-7 or 11 annulations respectively. And in the description of Hartman (1966, 1968), they are shorter (7-9 or 6-12) than ours either.

6. *Typosyllis aciculata orientalis* Imajima and Hartman, 1964 족자염주발갯지렁이

Typosyllis aciculata orientalis Imajima and Hartman, 1964, p. 130, pl. 31, figs. e-f, pl. 32, Figs. a-t; Imajima, 1966, p. 275; 1983, p. 454, fig. 41 a-m; Rho and Lee, 1987, p. 82, fig. 4; 1988, p.129.

Material examined. 1 specimen, K'ŭnsŏm, 29 July 1980 (J.I. Song); 1 specimen, Sŏgwip'o, 22 May 1982 (J.I. Song); 1 specimen, Pongnam, 2 July 1982 (J.I. Song); 1 specimen Mip'o, 26 Nov. 1983 (J.I. Song); 1 specimen, Maemulto, 18 July 1984 (J.W. Lee); 2 specimens, Samch'ŏnp'o, 21 July 1984 (J.W. Lee); 1 specimen, Sŏgwip'o, 16 Jan. 1985 (J.H. Park); 1 specimen, Jumunjin, 26 May 1985 (H.S. Choi); 3 specimens, Sŏngsanp'o, 9 July 1985 (J.W. Lee); 3 specimens, P'ohang, 10m depth, 27 Oct. 1985 (S.J. Yoon); 1 specimen, Chumunjin, 16 May 1987 (B.J. Rho); 8 specimens, Supsŏm, 14 July 1987 (J.W. Lee & J.I. Song); 4 specimens, Tŭksan, 13 Aug. 1987 (B.J. Rho & J.W. Lee); 5 specimens, Sŏngsanp'o, 8 Oct. 1987 (B.J. Rho); 1 specimen, Tangp'o, 9 Oct. 1987 (J.H. Park); 4 specimens, Pangp'o beach, 14 May 1988 (B.J. Rho & J.W. Lee); 1 specimen, Chukbyon, 26 June 1988 (J.W. Lee); 4 specimens, Taejin, 29 June 1988 (J.W. Lee); 3 specimens, Namyang, 19 June 1988 (B.J. Rho); 3 specimens, Todong, 19 June 1988 (B.J. Rho & J.I. Song); 1 specimen, Taeha, 19 June 1988 (B.J. Rho); 13 specimens, Naejangdo, 24 July 1988 (B.J. Rho & J.W. Lee); 83 specimens, Sŏdo, 29 July 1988(B.J. Rho & J.W. Lee); 71 specimens, Kŭmodo, 31 July 1988 (J.W. Lee); 2 specimens, Yokjido, 2 Sep. 1988 (J.I. Song); 1 specimens, Wimiri, 9 Dec. 1988 (J.W. Lee); 1 specimen, Piyangdo, 11 Dec. 1988 (J.W. Lee); 2 specimens, Changsŏngp'o, 19 July 1989 (J.I. Song); 3 specimens, Yundolsŏm, 19 July 1989 (J.I. Song); 2 specimens,

Haekŭmgang, 20 July 1989 (J.I. Song); 5 specimens, Pyonsan beach, 22 July 1989 (J.W. Lee); 3 specimens, Sŏgwip'o, 30m depth, 8 Jan. 1990 (J.W. Lee); 7 specimens, Sangjury, 26 Apr. 1990 (B.J. Rho & J.W. Lee); Mijori, 27 Apr. 1990 (B.J. Rho); 1 specimen, Nodo, 27 Apr. 1990 (B.J. Rho); 6 specimens, Kŭndŏk, 2 June 1990 (B.J. Rho & J.W. Lee); 3 specimens, Mangwolto, 21 July 1990 (J.W. Lee); 11 specimens, Jikgudo, 22 July 1990 (J.W. Lee); 7 specimens, Hoenggando, 23 July 1990 (J.W. Lee); 8 specimens, Hup'o, 24 July 1990 (J.W. Lee); 15 specimens, Naebal, 31 June 1991 (J.W. Lee); 6 specimens, Marado, 25 Oct. 1991 (scuba); 6 specimens, Pŏmsŏm, 22 Oct. 1992 (J.I. Song & J.H. Won); 1 specimen, Yoch'on, 4 Nov. 1991 (E.K. Kim).

Habitat. Aurface of ascidian, Bryozoa and coral, crevice of rock, shell of *Mytilus* and oyster, from seaweed, in Porifera, between or in tubes of polychaete.

Distribution. Japan, Korea.

7. *Typosyllis adamanteus kurilensis* Imajima and Hartman, 1964 쿠릴염주발갯지렁이

Typosyllis adamanteus kurilensis Imajima and Hartman, 1964, p. 134, pl. 33, figs. a-i; Imajima, 1966, p. 277; 1983, p. 454, fig. 41 s-z; Rho and Lee, 1982, p. 38, pl. 2, figs. 1-2; Paik, 1982, p. 38, pl. 2, figs. 1-2.

Material examined. 2 specimens, Kŭmodo, 31 July 1988 (J.W. Lee); 10 specimens, Changsŭngp'o, 19 July 1989 (J.I. Song); 5 specimens, Nodo, 27 Apr. 1990 (B.J. Rho & J.W. Lee); 1 specimen, Hup'o, 24 July 1990 (J.W. Lee); 1 specimen, Tongnaedo, 1 July 1991 (J.W. Lee); 6 specimens, Yach'ŏn, 4 Nov. 1991 (E.K. Kim); 5 specimens, Youmhae, 5 Nov. 1991 (E.K. Kim); 2 specimens, Tadaep'o, 25 Nov. 1991 (J.H. Won).

Habitat. Shell of *oyster* and *Mytilus*, from seaweed, surface of ascidian, coarce sand, in sandy silt.

Distribution. Kurile Is., Japan, Korea.

8. *Typosyllis ehlersioides* Marenzeller, 1890 톱날염주발갯지렁이

Syllis krohnii: McIntosh, 1908, p. 192, pl. 49, fig. 6, pl. 79. Fig. 12.

Syllis (Typosyllis) krohnii: Fauvel, 1923, p. 259, fig. 96 a-e.

Typosyllis ehlersioides: Imajima, 1966, p. 279, text-fig. 60 a-o; 1983, p. 456, fig. 42 i-p; Paik, 1982, p. 778, pl. 10 e-f.

Material examined: 3 specimens, Tŏksan, 12 Aug. 1987 (B.J. Rho); 2 specimens, Sangjuri, 26 Apr. 1990 (J.W. Lee); 2 specimens, Nodo, 27 Apr. 1990 (B.J. Rho); 1 specimen, Mijori, 27 Apr. 1990 (J.I. Song); 6 specimens, Jikgudo, 22 July 1990, 5-6 m (J.W. Lee); 1 specimen, Hup'o, 24 July 1990 (J.W. Lee); 1 specimen, Ch'agwido, 23 Oct. 1991 (J.I. Song).

Habitat. From seaweeds, surface of ascidian and Hydrozoa.

Distribution. Bering Sea, southern to northern Japan, Korea.

9. *Typosyllis variegata* (Grube, 1860) 참염주발갯지렁이

Syllis (Typosyllis) variegata: Fauvel, 1923. p. 262, fig. 97 h-n; 1953, p. 148, fig. 74 h-n; Okuda, 1939, p. 183, fig. 1; Okuda and Yamada, 1954, p. 192; Day, 1967, p. 248, fig. 12.3 j-l; Knox, 1960, p. 99.

Typostllis variegata: Hartman, 1961, p.17; 1964, pl. 29, figs. 8-9; 1968, p. 495, figs. 1-5; Imajima and Hartman, 1964, p. 137, pl. 34, figs. a-i; Imajima, 1966, p. 292; 1984, p. 54, fig. 44

u-z; Rho and Lee, 1987, p. 82-84, fig. 5; 1988, p. 129.

Syllis variegata: Ushakov and Wu, 1962, p. 59; Banse and Hodson, 1968, p. 65.

Typosyllis (Typosyllis) variegata: Hartman-Schröder, 1971, p. 148.

Material examined. 1 specimen, Namyang, 19 June 1988 (J.I. Song); 2 specimens, Sangjuri, 26 Apr. 1990 (B.J. Rho); 1 specimen, Mijori, 27 Apr. 1990 (J.I. Song); 5 specimens, Nodo, 27 Apr. 1990 (B.J. Rho & J.W. Lee); 1 specimen, Jikgudo, 5-6m, 22 July 1990 (scuba); 1 specimen, Hoenggando, 23 July 1990 (J.W. Lee); 5 specimens, Marado, 25 Oct. 1991 (scuba).

Habitat. Surface of Bryozoa and coral, from seaweed, shell of oyster, among tubes of Polychaeta, in Porifera.

Distribution. Southern Europe, Mediterranean, southern California, Persian Gulf, Australia, Indo-Pacific Ocean, Magelan Channel, Yellow Sea, Bering Sea, Japan, Korea.

10. *Typosyllis fasciata* (Malgren, 1867) 긴수염염주발갯지렁이

Syllis fasciata Malmgren, 1867, p. 43, pl. 8, fig. 47, pl. 9, Fig. 52(cited from Imajima, 1966): Berkely and Berkely, 1948, p. 74, text-figs. 109-110); Uschakov and Wu, 1962, p. 58; Banse and Hodson, 1968, p. 64.

Syllis (Typosyllis) fasciata: Uschakov, 1955, p. 180, text-figs. 46,51.

Typosyllis fascita: Imajima, 1963, p. 353; 1966, p. 276; 1983, p. 454, fig. 41 n-r; Imajima and Hartman, 1964, p. 135, pl. 33, figs. j-o; Reish, 1965, p. 138; Paik, 1976, 234, fig. 14; 1982, p. 778, pl. 10 a-d; Rho and Lee, 1987, p. 77; 1988, p. 129.

Material examined. 3 specimens, Wolsŏng, 9 June 1985 (J.I. Song); Paeknyongdo, 4 Oct. 1986 (J.W. Lee); 1 specimen, Chumunjin, 16 May 1987 (B. J. Rho); 1 specimen, Anhŭng, 1987 (C.H. Chung); 2 specimens, Tŏksan, 3m depth, 14 Aug. 1987 (B.J. Rho); 10 specimens, Mipo, 10 Oct. 1987 (B.J. Rho); 1 specimen, T'onggumi, 19 June 1988 (B.J. Rho); 3 specimens, Ch'ŏnbu, 20 June 1988 (B.J. Rho & J.I. Song); 1 specimen, Kŭmodo, 31 July 1988 (J.W. Lee); 2 specimens, Pyunsan beach, 22 July 1989 (J.W. Lee); 1 specimen, Sŏgwip'o, 80m depth, 8 Jan. 1990 (B.J. Rho); 2 specimens, Sangjuri, 26 Apr. 1990 (B.J. Rho); 6 specimens, Jikgudo, 22 July 1990 (J.W. Lee); 2 specimens. Hup'o, 24 July 1990 (J.W. Lee).

Habitat. shell of *oyster* and *Mytilus*, among seaweeds, surface of ascidian.

Distribution. Northern Atlantic Ocean, northern Pacific Ocean, Bering Sea, Yellow Sea, northern Japan, Korea.

11. Typosyllis prolifera (Krohn, 1852) 분열염주발갯지렁이

Syllis (Typosyllis) prolifera: Fauvel, 1923, p. 261, fig. 97 a-g; Day, 1967, p. 248, fig. 12.3 g-i.

Syllis (Typosyllis) prolifera var. *zonata*: Knox, 1960, p. 103.

Typosyllis prolifera: Imajima, 1966, p. 292, text-fig. 65; 1984, p. 52, fig. 43; Paik, 1982, p. 779, pl. 10 g-h.

Material examined. 1 specimen, Jikgudo, 22 July 1990 (J.W. Lee); 1 specimen, Hoenggando, 23 July 1990 (J.W. Lee); 8 specimens, Chukjŏng, 1 July 1991 (J.W. Lee).

Habitat. Among seaweed.

Distribution. Southwestern Africa, England Channel, Mediterranean Sea, Atlantic Ocean, Indian Ocean, Indo-western Pacific, Japan, Korea.

REFERENCES

Amourex, L. and F. Rullier, 1978. Systematique et ecologie d'Annelides Polychaetes de la Presqu'il du Sinai. Isr. J. Zool. **27:** 57-163.

Banse, K. and K.D. Hodson, 1968. Benthic polychaetes from Puget Sound, Washington with remarks on four other species. Proc. U.S. Natl. Mus. **125:** 51-65.

Berkeley, E. and C. Berkeley, 1948. Annelida, Polychaeta, Errantia. Canad. Pac. Fauna, **9b**(1): 1-100, 160 figs.

Day, J.H., 1967. A monograph on the Polychaeta of southern Africa, British Museum Nat. Hist. Publ., **656:** 1-878.

Fauvel, P., 1923. Polychaetes errantes. Fauna de France. **5:** 1-488, 181 figs.

Fauvel, P., 1934. Sur quelques syllidiens du Japan. Annot. Zool. Japan, **14:** 307-309.

Fauvel, P., 1953. The Fauna of India including Pakistan, Ceylon, Burma and Malaya. Annelida Polychaeta. Allahabad, **7:** 147-148.

Hartman, O., 1945. The marine annelids of North Carolina. Bull. Duke Univ., Mar. Sta., **2:** 1-54, 10 pls.

Hartman, O., 1961. Polychaetous annelids from Califorina. Allan Hancock Foundation, Pac. Exped., **25:** 1-226, 34 pls.

Hartman, O., 1964. Polychaeta Errantia of Antarctica. Antarctic Research, ser., **3:** 1-131.

Hartman, O., 1966. Polychaetous annelids of the Hawaiian Islands. Bernice P. Bishop Museum Honolulu, Hawaii, **23**(11): 163-252.

Hartman. O., 1968. Atlas of errantiate polychaetous annelids from California. Allan Hancock found., Univ. S. Calif., Los Angeles, pp. 1-812.

Hartman, O. and C. Schr der, 1971. Annelida, Borstenw rmer, Polychaeta. UEB Gustab Fischer Verlag Jena, pp. 1-594.

Imajima, M., 1966. The Syllidae (polyschaetous annelids) from Japan (5). Syllida (2). Publ. Seto Mar. Biol. Lab., **14**(4): 253-294.

Imajima, M., 1967. Errant polychaetous annelids from Tsukumo Bay and vicinity of Noto Penninsula, Japan. Bull. Natl. Sci. Mus., Tokyo, **10**(4): 403-441.

Imajima, M. 1983a. Systematics and ecology of the Japanese polychaetes (19): 3. Systematics of the family Syllidae-13. Aquabiology 27, **5**(4): 298-301.

Imajima, M., 1983b. Systematics and ecology of the Japanese polychaetes (20): 3. Systematics of the family Syllidae-14. Aquabiology 28, **5**(5): 376-379.

Imajima, M., 1983c. Systematics and ecology of the Japanese polychaetes (21): 3. Systematics of the family Syllidae-15. Aquabiuology 29, **5**(6): 454-457.

Imajima, M., 1984. Systematics and ecology of the Japanese polychaetes (22): 3. Systematics of the family Syllidae-16. Aquabiology 30, **6**(1): 52-55.

Imajima, M. and O. Hartman, 1964. The polychaetous annelids of Japan. Part 1. Allan Hancock Found. Occas. Pap., **26:** 1-237.

Knox, G.A., 1960. The Polychaeta Errantia of the Chatham Islands 1954 Expedition. N.Z., Dept. Sci. Indus. Res. Bull., **139**(3): 77-140.

Kudenov, J.D., 1980. Common intertidal invertebrates of the Gulf of California, Annelida, Polychaeta. Univ. S.

California, Los Angeles.

Malmgren, A.J., 1867. Annelida Polychaeta Spetsbergiae, Gronlanda. Islandiae et Scandinaviae (cited fromm Imajima, 1966).

McIntosh, W.C., 1904. Marine annelids (Polychaeta) of south Africa. Proc. Nat. Hist. Univ. St. Andrew, pp. 19-56.

McIntosh, W.C., 1908. A monograph of the British annelids. 2(2) Polychaeta. Amphnomidae to Sigalionidae. Ray Soc. Publ. London, pp. 215-442.

Monro, C., 1937. Polychaeta. In: Scientific Reports of the John Murray Expedition 1933-1934, **4**(8): 273-275.

Okuda, S., 1939. Polychaetous annelids collected by Prof. Teiso Esaki at Kusaie and Korror in the Carollines, South Sea Islands. Annot. Zool. Japan, **18**(3): 183-184.

Okuda, S. and M. Yamada 1954. Polychaetous annelids from Matshima Bay. J. Fac. Sci., Hokkaido Univ., **12**(1-2): 175-199.

Paik, E.I., 1976. The polychaetous annelids in Korea (IV). Bull. Father Jeon's 60th Anniversary, pp. 231-242.

Paik, E.I., 1979. Benthic polychaetous annelids from Goemun-do and Baeg-do Isl., Korea. Bull. Korean Fish. Soc., **12**(1): 41-63.

Paik, E.I., 1982. Taxonomic studies on polychaetous annilids species in Korea. Res. Bull. Hyosung Women's Univ. **24:** 45-913 (in Korean).

Rho, B.J,. and K.H. Lee, 1982. A taxonomic study on the polychaetouuus annelids in Korea (4). J. Korean Res. Inst., **30:** 35-51.

Rho, B.J. and J.W. Lee, 1987. A systematic study on the errantiate Polychaeta in Korea. Korean J. Syst. Zool., **3**(1): 74-90.

Rho, B.J. and J.W. Lee, 1988. A systematic study on the errantiate Polychaeta in Cheju Island. Korean J. Syst. Zool., **4**(2): 121-136.

Uschakov, P. and B.L. Wu, 1962. Litoral fauna of polychaete worms of the Provinces Futszyan and Chazetshan. Studia Marina Sinica, **1:** 89-108.

RECEIVED: 25 September 1996
ACCEPTED: 4 December 1996

한국 남해 및 동해의 침염주발갯지렁이류 및 참염주발갯지렁이류

이 종 위·노 분 조
(이화여자대학교 자연과학대학 생물과학과)

요 약

한국의 동해 및 남해로부터 침염주발갯지렁이류(*Langerhansia* Czerniavsky, 1881) 2종, 참염주발갯지렁이류(*Typosyllis* Langerhans, 1879) 9종의 분류목록을 작성하였다. 그 중, 4종 *L. cornuta*(Lathke, 1843), *L. rosea*(Langerhans, 1879), *T. okadai*(Fauvel, 1934) and *T. hyalina*(Grube, 1863)은 우리나라에서 처음으로 보고되는 종이며, 침염주발갯지렁이류는 우리나라에서 처음으로 보고되는 속이다.